Space Weather Forecast

Issued on Saturday, 10 June 2023 at 13:13 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate X-ray flares (R1-R2 radio blackouts) throughout. Slight chance of Minor Geomagnetic Storms 11-12 June.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate, with an impulsive Moderate flare at 09/1711UTC originating from a large sunspot region on the southeast of the visible disc. This produced a coronal mass ejection (CME) which analysis suggests may have a slight Earth-directed component. There are currently nine regions on the disc, the largest of which is in the southeast and responsible for the Moderate flare observed. Two other regions are relatively large and complex, one in the northwest and the other in the southwest, however both have been relatively inactive. The remaining regions are all mainly benign. No other Earth-directed CMEs have been observed on available coronagraph imagery.

Solar Wind / Geomagnetic Activity: The solar wind speed are at ambient levels and on a slow rising trend, initially 280 km/s and currently around 320km/s. The total magnetic field strength was weak, with the important north-south component near neutral initially, before fluctuating weakly from 09/1500UTC. Resultant geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Mainly Low to Moderate solar activity is forecast, with only a small number of significant regions on the visible disc, and limited flaring observed. Two regions in the centre disc and one region in the southeast pose the greatest risk of Moderate flares, with the other regions relatively small and/or stable. A potentially stronger region is in the process of rotating onto the disc and will be monitored for any development.

Solar Wind / Geomagnetic Activity: No Earth-directed coronal mass ejections (CMEs) are expected to affect the Earth. Moderate risk of a glancing blow on Day 2 (11 June), or possibly Day 3 (12 June). Fast solar winds may affect the Earth from Day 1-2 (10-11 June), possibly giving speeds of 400-450km/s but with low confidence. Geomagnetic activity is forecast to be mainly Quiet (Kp 0-2), with a slight chance of Active (Kp 4) or of a G1/Minor Storm interval (Kp 5) Day 2-3. No appreciable enhancement of the auroral oval is expected.

Energetic Particles / Solar Radiation: Solar radiation storms are not expected, however there is a very slight chance of reaching the S1/Minor Storm threshold should any larger X-ray flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	15	10	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	45	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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